

## "Semarang is like sugar": on the complex relation of environmental change and migration

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# „Semarang is like sugar“: on the complex relation of environmental change and migration

Usha Ziegelmayer

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# **“Semarang is like sugar”: on the complex relation of environmental change and migration<sup>1</sup>**

**Usha Ziegelmayr**

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# 1 Introduction

As an article in the Indonesian newspaper *Jakarta Post* stated in March 2018, “Indonesia is among the countries with the highest risk of being affected by climate change as many of its islands could disappear from rising sea levels.” The south-east Asian country is among the ten countries with the highest population worldwide and consists of more than 17,000 islands. Using the example of the coastal city of Semarang in Central Java, Indonesia, this paper seeks to understand how coastal populations in Indonesia deal with consequences of climate change.

Climate change is a major challenge for today’s societies. At the same time UNHCR reported a record number of 65.6 million people displaced at the end of 2016 (UNHCR, 2017), the highest number ever recorded.

In the media, as well as in publications authored by international non-governmental organisations (NGOs), these two phenomena – climate change and migration – are often presented as directly linked. Their shared discourse supposes that environmental or climate change leads to out-migration in affected areas. In November 2017 the international NGO *Oxfam* published a report “Uprooted by Climate Change – responding to the growing risk of displacement”. This report starts as follows:

*Climate change is already forcing millions of people from their land and homes, and putting many more at risk of displacement in the future. Supercharged storms, more intense and prolonged droughts, rising seas and other impacts of climate change all exacerbate people’s existing vulnerabilities and increase the likelihood of being forced to move. (Richards and Bradshaw, 2017: 3)*

It seems obvious that where sea levels rise, coasts erode, rainfall becomes more erratic and desertification increases, populations are forced to move in search of safer places. Research, however, argues that the relation between environmental changes and migration is not so direct. The literature suggests a temporal distinction among environmental changes: between rapid onset environmental changes, on the one hand—such as landslides, droughts, heat waves, floods and earth quakes— and slow-onset environmental change on the other, such as desertification, soil degeneration, air pollution, sea level rise, and changing rainfall patterns. This temporal differentiation is often combined with the distinction between anthropogenic and natural causes of environmental change. (Hillmann, 2016: 176) In her work on natural hazards and migration, Lori M. Hunter suggests, “that the association between migration and environmental hazards varies by context, hazard type, and household characteristics.” (Hunter, 2013: 297) She thereby stresses the non-linearity and context dependency of migration in a context of environmental hazards. Susana B. Adamo, in her work on migration and sea-level rise and flooding, stresses that permanent mass migration is not a common consequence of natural disasters; temporal migration is common in such situations. She continues, stating, “that migration is highest if damage to housing and infrastructure is combined with reduced income or working opportunities in places where out-migration was already taking place before.” (Adamo, 2013: 123)<sup>2</sup> This last quote refers to the crucial aspect of migration experience and history of a respective region and its populations affected by environmental and climate change.

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<sup>2</sup> Both cited works of Hunter and Adamo are part of Graeme Hugo’s anthology *Migration and Climate Change* (2013) which gathers many of the most influential writings within the field of environmental change and migration.

Despite the growing number of refugees and migrants worldwide – and the growing urgency of climate change and its consequences for people around the world, especially in the Global South – academic research shows that the relation between environmental change and migration is neither straightforward nor mono-causal. Environmental change does not necessarily lead to (mass)migration<sup>3</sup>. Hillmann et al. (2015) argue that the debate on environmental change and climate change is somehow biased towards natural hazards like thunderstorms or cyclones, forcing many people to leave their homes (temporarily). In 1996, the migration researcher Graeme Hugo already argued that, especially in the least developed countries (LDCs), “the deeper underlying causes of environmental migration are not environmental but rather linked to political, economic, social and demographic processes.” (1996: 118).

Laczko and Piguet (2014), along with other migration researchers<sup>4</sup>, underline that the multi-causality of migration decisions also applies to the context of environmental change. In 2010, Piguet already emphasized: “There is agreement today that natural factors are not the sole cause of migration and that the economic, social and political situations of the zone under threat can, depending on the case, increase or decrease the flow of migrants.” (Piguet, 2010: 76)

Academic research nevertheless agrees with the above mentioned public discourse that the link between environmental change and migration exists. But it is a complex connection, not a mono-causal one, influenced by various factors in addition to environmental change. And, as this paper will show, not everybody affected by environmental change wants, or even has the means, to move.

We therefore aim to contribute to the debate on environmental change and migration using mainly qualitative data from a case study in Semarang City<sup>5</sup> on the Northern coast of Central Java (Indonesia). Semarang has been selected as a case study due to its long history of environmental change. It thus serves as an example of how human behaviour increasingly impacts on coastal areas and their ecosystems, as well as demonstrating the reaction of local populations to those environmental changes, especially in terms of migration and (im)mobility. As shown above, research suggests a non-linearity and non-causality of nexus environmental change and migration, but it is still very much unknown what this relationship really looks like.

As stated above, migration and (im)mobility in the context of environmental change are influenced by the given socio-economic context. Urbanisation processes are part of these socio-economic contexts and as this paper will show play a crucial role in the case of Semarang.

Migration in general is primarily internal, within one country, rather than international. This holds true for migration in the context of environmental change as well, whereas migration related to environmental factors is not only mainly internal, but likely to occur over short distances within the same country. (cf. Laczko and Piguet, 2014; Massey et al. 2007; Obokata et al. 2014) Furthermore Laczko

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<sup>3</sup> cf. Black 2001; Black et al. 2008; Castles 2002; Morrissey 2012; Mortreux and Barnett 2009; Schraven and Rademacher-Schulz 2015; Tacoli 2009; Warner et al. 2015.

<sup>4</sup> See also: Black et al. 2011; Castles 2002; Hugo 1996; Piguet 2010; Tacoli 2011.

<sup>5</sup> The research presented here refers to Semarang City (Kota Semarang) on the Northern coast of Central Java, not to Semarang Regency (Kabupaten Semarang) which is located inland south of Semarang City.

and Piguet (2014) underline the resilience and the different adaptation strategies of populations affected by environmental change. Migration in this understanding can be an adaptation strategy to climate change and not merely a problem provoked by climate change.<sup>6</sup>

Semarang is characterized by more in- than out-migration, according to official figures (BPS 2012), and therefore puts into question the assumption that environmental changes lead to out-migration.. The urban context of Semarang reminds us of Laczko's and Piguet's remark on migration and environmental change in urban areas:

*In many parts of the world, towns are the main destinations for internal and international migrants, who are driven by, among other factors, environmental change. However, urban settings are often themselves vulnerable to environmental changes, such as sea-level rise, landslides and hurricanes, with the result that migrants may find themselves in a vicious circle of vulnerability. (Laczko and Piguet, 2014: 16f)*

Based on the assumption that the relation between environmental change and migration is neither linear nor mono-causal, the main research question for this paper is the following: who moves from and who stays in coastal Semarang, a place affected by various environmental changes, and why? We furthermore aim to understand how people affected by environmental change in Semarang decide whether to move or to stay. What are the influencing factors? Semarang serves as a showcase for the complexity and non-linearity of the relationship of environmental changes and migration. Despite various environmental changes, there are more people moving to Semarang than leaving. The assumption of environmental change leading to out-migration does not seem to hold true for the case of Semarang. But why? Finally, we also aim to analyse who moves into coastal Semarang, despite environmental changes, and we ask why these people arrive, and stay in.

## **2 Study area Semarang City: migration and (im)mobility in a context of environmental change and urbanisation**

The context of Semarang shows that in areas of slow-onset environmental changes, such as erosion, sea level rise (SLR), salinisation and land subsidence, do not forcibly lead to (massive) out-migration. On the contrary, some people move, but often not very far or only temporarily; some stay; and a third group of people even migrate into those coastal areas affected by environmental changes. Interconnected with environmental changes, several other factors influence migration decision making and (im)mobility.

Semarang has a population of about 1.5 million and is the fifth largest city in Indonesia. It is located at the Northern coast of the Indonesian province of Central Java. The city has been an important trading hub since colonial times. Semarang was founded in 1547 as a trade and port city. The city back then was composed of indigenous Javanese settlements, a Chinese population, as well as a Dutch fortress. It was only in the mid-18<sup>th</sup> century that the city gained importance as a trading spot for commodities from other islands to be exported via Semarang's port. At that time, Semarang attracted many foreigners (Dutch, Chinese and East Asian) who migrated there as traders, leading to rapid population growth and

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<sup>6</sup> Cf. Tacoli, 2009; McLeman and Hunter, 2010; Ziegelmayer et al., forthcoming.

making Semarang the third largest harbour on the island of Java. (Setioko, 2010) Still today, the port connects Semarang to other Indonesian islands as well as to international locations. Nowadays the port itself, as well as the neighbouring coastal industrial area, attract many workers from neighbouring regencies.

Semarang is also attractive to investors due to its port and its various industrial, service and manufacturing companies including the textile industries mentioned above. Furthermore, Semarang is home to numerous universities and other educational facilities, and therefore represents an important destination for students from the surrounding areas.

Semarang City is part of the “Semarang Metropolitan Area” (SMA), or Greater Semarang “Kedungsapur,” which includes Semarang City, Salatiga, Semarang Regency, Kendal Regency, Grobogan Regency and Demak Regency. It is one of the national strategic growth areas defined by the Indonesian Government in 2011 in its “Masterplan for Acceleration and Expansion of Indonesia's Economic Development” (abbreviated MP3EI). The area counted about 5.4 million inhabitants in 2010.

Referring to Gilbert and Gugler (1991: 42), Handayani and Kumalasari (2015) point to the strong influence of international capitalism leading to “peripheral urbanisation” in Indonesia and many other Asian developing countries. The authors refer to the important role of multinational corporations, e.g. manufacturing industries that largely influence urban growth in Asia. This holds true for Indonesia and Semarang as well, where textile factories represent an important employer for migrants from the surrounding (rural) areas, as the case of female in-migrants to Semarang presented in this paper shows.

Handayani and Kumalasari (2015) underline the “significant gap in the standard of living, facilities provision and most of all employment opportunities” between Semarang and the surrounding (rural) areas to explain population movements linked to coastal industrial development.

Urbanisation is playing a major role in Semarang and its surroundings. As in other urban areas around the globe, urbanisation rates in Central Java are constantly rising: “40.4 percent in 2000, 56.2 percent in 2010” and projected rates of “73.8 percent in 2025” (Indonesian Statistical Bureau, 2010, cited in Hillmann & Spaan 2017: 41). Compared to 1971 when only three Indonesian cities were categorised as metropolitan cities (Jakarta, Bandung and Surabaya), in 2010 there were already 14 metropolitan areas, including Greater Semarang with a total population of 6.5 million.

If one looks at the settlement history of Semarang, one realizes that some of today’s environmental problems in the coastal areas are closely linked to how and where people settled. Figure 1 shows clearly how the coastline moved within the last 300 years due to sedimentation and how it grew “into the sea” as settlements were built on wet land and alluvial soil. In addition to these settlements on wet land, there have also been some reclamation projects e.g. Marina Bay next to the harbor where land was “reclaimed” from the sea to build residential areas.





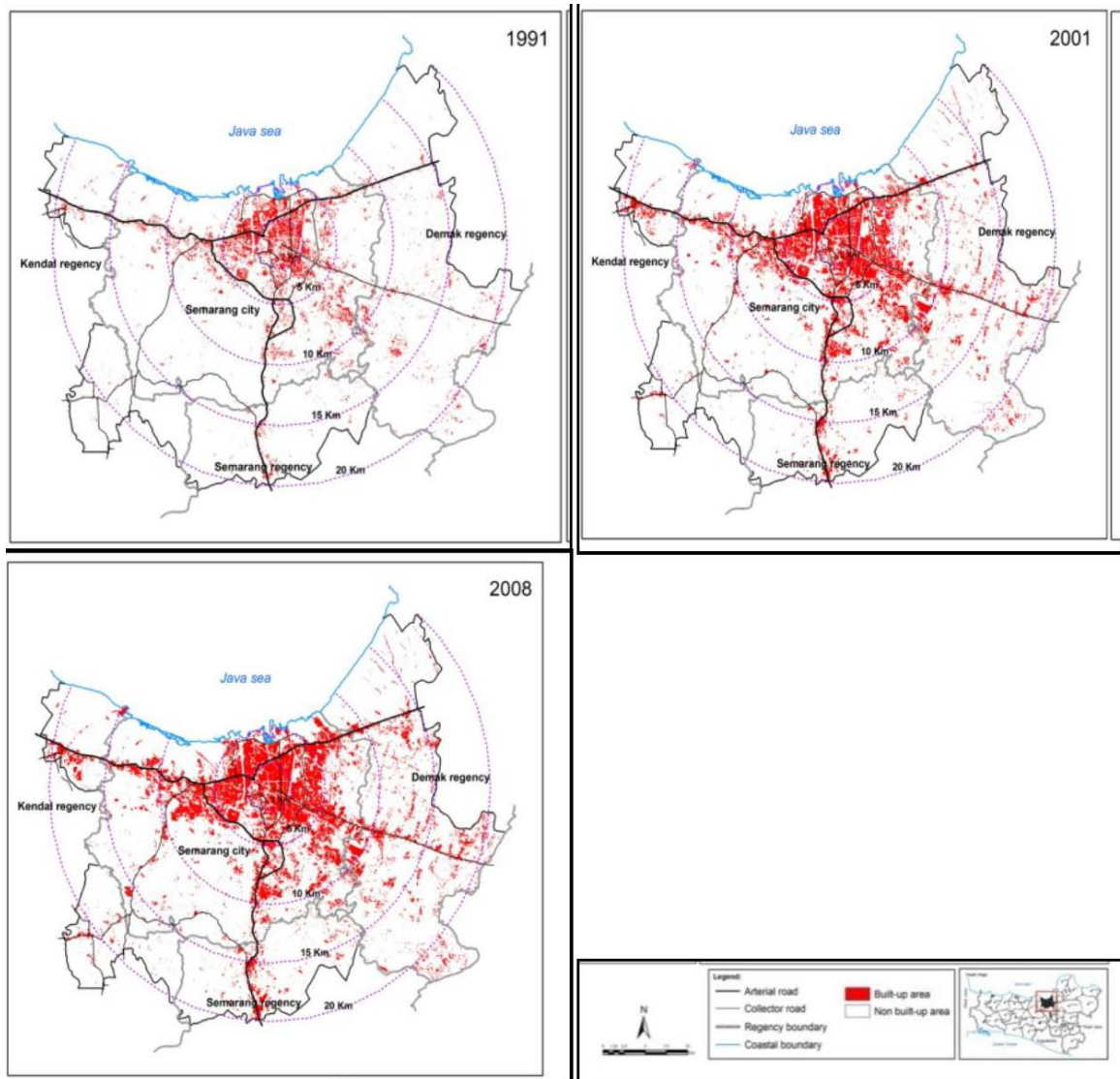
Figure 1: Semarang's coastline from 1741-2007 (Helmi 2014)

In addition to these settlements in the coastal wetlands, the topography of Semarang, with a low lying coastline in the North, where the majority of the population lives, and a steep mountain area in the South (Helmi et al., 2014: 27) exacerbates the risk of flash floods along the rivers and tidal floods at the coast (cf. Marfai et al., 2008; Anita and Latief, 2013). Population figures for “low elevation coastal zones” (LECZ)<sup>7</sup> are between 400 and 600 million people worldwide. (Anthoff et al., 2006, cited in Piguet, 2010: 80) This, however, does not mean that all those people will migrate in the future. (Piguet, 2010: 80) In Semarang almost 840,000 live within this LECZ. (Mulyana et al., 2013b: 2) In Semarang this situation is worsened by increasing transformation of forests into settlements at higher altitudes, reducing the soil's capacity to absorb rain water in those areas. Additionally, since the 1990s, mangroves along the coast were destroyed in great numbers in order to create fish ponds and shrimp farms, thus destroying an important natural form of coastal protection.

According to the NRF survey, 36 percent of the interviewed households had already experienced river flooding (*banjir*), 17 percent had experienced tidal flood (*rob*) and 8 percent of the interviewed households have experienced land subsidence. Hillmann & Spaan (2017) describe that various environmental changes in Semarang's coastal areas negatively impact the livelihoods, social networks and health of the populations concerned. Referring to Mulyana et al. (2013b), the authors emphasize the importance of successful coping mechanisms and of the level of vulnerability in determining how households are affected by environmental changes. It is not only their financial income that counts. (Hillmann & Spaan, 2017: 43)

<sup>7</sup> LECZ refers to the zone less than 10m above sea level (MacGranahan et al. (2007)).

Handayani and Rudiarto's work on suburbanization in Semarang (2014) indicates how the city expanded, despite the risk of flooding, within the last decades (Figure 2). Today's urbanisation comes with rising groundwater extraction, especially in the densely populated coastal areas, leading to a worsening of land subsidence (Marfai and King, 2007, Marfai et al., 2008). The yearly rate of land subsidence is between 2 and 10 cm per year, sometimes going as high as 16cm. (Marfai and King, 2008)



**Figure 2: Built-Up Area Expansion of Semarang Metropolitan, 1991, 2001, 2008** (Handayani and Rudiarto, 2014: 84)

Since the 1990s urbanisation in Semarang led to transformation of former forest land in the southern areas of the city at higher altitudes into settlement areas. These areas serve as settlement for newcomers from places outside Semarang (who are often economically better off), as well as for those who can afford to leave the coastal areas and buy a new house in these southern parts of town. In this context, that of a growing city, those who decide to leave the coastal areas (due to environmental changes) would rather move to other parts of town than leave Semarang completely.



Despite the risks of SLR, erosion and flooding, the city with its port, industries and service sector, as well as manufacturing and aquaculture, represents the core of the above-mentioned Semarang Metropolitan Area SMA (Kedungsepur). As Hillmann and Spaan point out, an urban corridor has recently connected Semarang to Yogyakarta on the southern Coast of Central Java. (Hillmann and Spaan, 2017: 41f)

Semarang experienced a yearly population growth of 1.4 percent in 2010, higher than the neighbouring regencies of Demak in the East, Kendal in the West and Semarang Regency in the South. These statistics reflect the importance of in-migration for Semarang, despite environmental changes, as well as increase due to natural population growth. (Mulyana et al., 2013a)

As Hillmann and Spaan point out, the majority of migration movements within Indonesia are directed “from the outer islands to the coastal urban centres on Java” (2017: 32). This puts the urban centres under pressure in terms of infrastructure and environment. (ibid.)

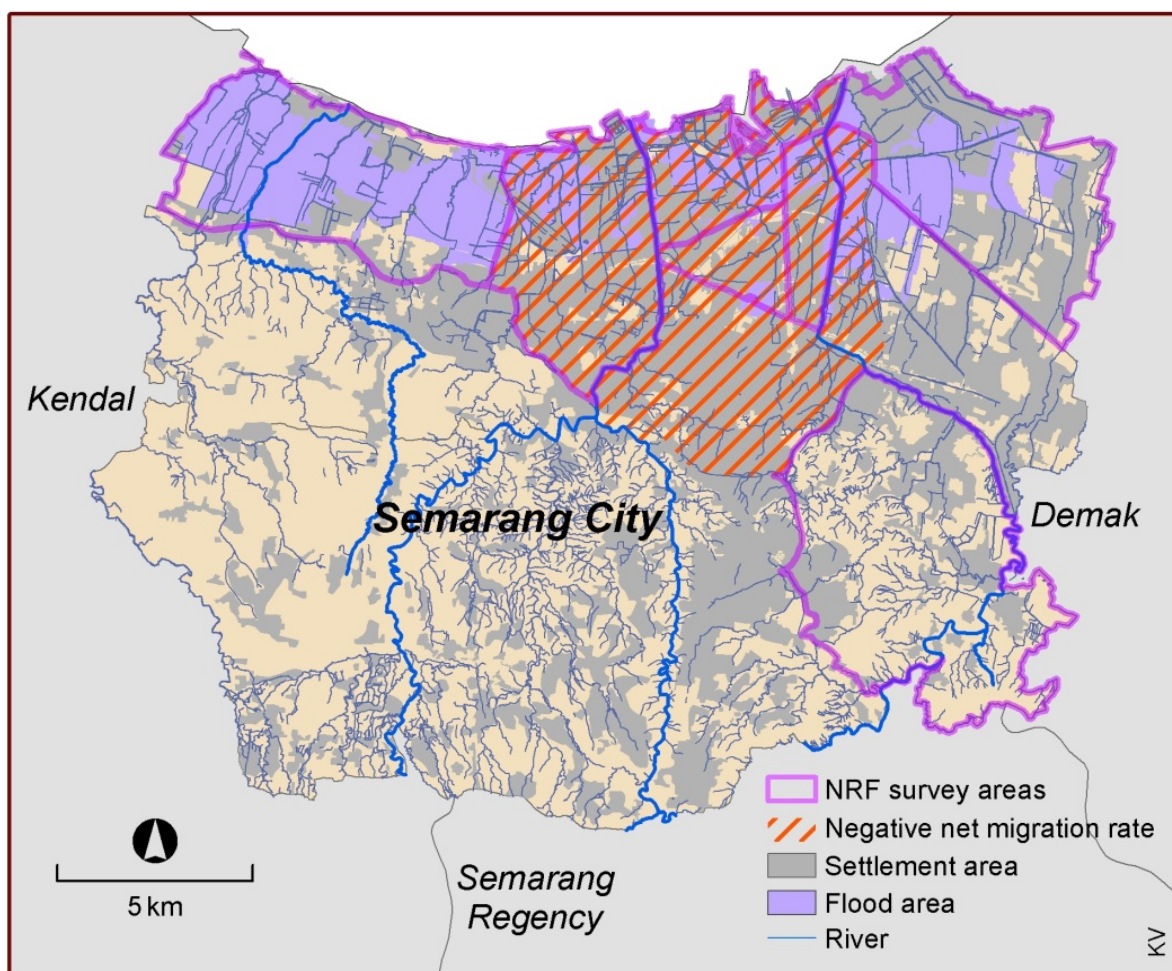


Figure 3: Map study site Semarang <sup>8</sup>

<sup>8</sup> Design: Ziegelmayr and Hillmann, Graph: Kartographieverbund TU Berlin; migration data according to BAPPEDA and BPS Kota Semarang 2012: xiv; data on settlement areas and flooded areas according to Helmi 2014.

Central Java is traditionally a region of out-migration; Semarang is the only city, among all regencies and cities in the province, that indicates a positive net-migration. (BPS 2012) Semarang's neighbouring regencies report more out-migration than in-migration, an indicator for rural-urban migration to Semarang.

If one looks more closely at Semarang's net-migration rate on a sub-district level, one realises that half of the 16 sub-districts report a negative net migration rate (Bappeda and BPS Kota Semarang, 2012: xiv). Those sub-districts are located in the core area at the coast and in the city centre (see figure 3), an indicator for internal movements within Semarang from the core to the peripheral areas. Setioko explains this "suburbanization" as? the movement of universities, government offices as well as shopping facilities and industries to the fringe areas, leading to an unbalanced population growth. (Setioko, 2010: 153f)

Semarang's working population is mainly employed as industrial workers (25 percent), construction workers (13 percent), government employees/armed forces (16 percent), services (10 percent) and farmers (5 percent). The city is an important centre for trade, hotels and gastronomy in the region. About a third of its population lives in poverty, with substantial differences within the city. (Mercy Corps, 2010: 15f). The majority of the population of Semarang is of working age: 70 percent are between 15-59 years old, 24 percent under 15 years and only 7 percent older than 59 years<sup>9</sup>. This population distribution might partly be explained by on-going in-migration of migrant workers from surrounding rural areas into the city.

Coming back to the importance of the socio-economic and historical context for migration decisions, one should keep in factors." (Ziegelmayr and Spaan, 2018)<sup>10</sup>

### 3 Methodology

This paper is based on data collected during fieldwork in Semarang (Indonesia) in 2014 and 2015: a quantitative household survey (NRF Survey; n=333) that serves as background information for this paper<sup>11</sup> and qualitative semi-structured interviews with migrants households in Semarang (n=26), as well as migrants from other places living in Semarang (n=16) and experts (n=09). The experts interviewed were researchers from the department of Anthropology at Diponegoro University in Semarang working on migration in Semarang, as well as representatives of the city administration working on adaptation measures to climate change in Semarang. This paper primarily draws upon the qualitative interviews.

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<sup>9</sup> Own calculation based on 2010 Population Census Data - Statistics Indonesia.

<sup>10</sup> This quote refers to research on migrant trajectories in a context of environmental change in coastal Ghana as part of the same NRF research project.

<sup>11</sup> For a more detailed analysis of the quantitative data of the NRF Survey in Indonesia and Ghana, please see Hillmann & Ziegelmayr 2016.

The fifteen *Kelurahan*<sup>12</sup> for the household survey were selected from among those most affected by environmental changes as well as those characterized by high in- and out-migration according to the 2010 census<sup>13</sup>. From those *Kelurahan*, three were selected for the qualitative interviews: Rejosari, Panggung Lor and Tanjung Mas. This selection was based on high in- and out-migration according to the NRF survey and on the relatively high prevalence of tidal and river flooding. The households for the qualitative interviews were selected from the survey sample based on the migration experience of the household as a whole and its members. In addition to household interviews in those three *Kelurahan*, interviews were conducted with households that had moved away from those *Kelurahan* to another area of Semarang (n=08).<sup>14</sup>

#### **4 Leaving or staying...: insights into migration decision making in Semarang**

The question of who decides to move and who decides to stay, despite constant problems with flooding and land subsidence, depends on various factors.<sup>15</sup>

The NRF survey confirms this picture of Semarang as not being affected by massive out-migration, as one could suppose due to the various environmental stresses. The survey indicates that 54 percent of the interviewed households have always lived at their current place of living. Out of those who moved to their current place, 28 percent previously lived elsewhere in Semarang, indicating internal migration within Semarang. The survey confirms the dominance of rather short distance and internal movement even within Semarang: 32 percent of migrants from the interviewed households moved within Semarang, 47 percent moved to other places in Java – the majority of them staying in Central Java, 16 percent to other Indonesian islands and only 4 percent to other countries<sup>16</sup>. Instead of moving as a whole household, quite a high number of interviewed households reported out-migrants among their members: 39 percent had 3 to 4 household members that moved away. The reasons for their movement were mainly family (59 percent) or work (32 percent) related. Seven percent moved because of educational reasons. The profile of the out-migrants is rather gender balanced according to the survey, with 76 percent being between 20 and 39 years old, meaning of the age at which people typically marry and look for work elsewhere. Quite surprisingly, less than half of the migrants contribute to the household income of those who stayed in the coastal area (38 percent send money, 5 percent send

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<sup>12</sup> *Kelurahan* is an administrative sub-division in Indonesian cities that represent “urban communities”. Semarang City consists of 16 *Kecamatan* (sub-district) and 177 *Kelurahan*.

<sup>13</sup> The data for this selection is based on the census 2010, “Semarang in Figures 2012” and publications on the different *Kecamatan* in Figures 2014.

<sup>14</sup> As during the field research many respondents stated that people had left their *Kelurahan* due to environmental changes but were not able/willing to give out contacts of those people, the migration data at the *Kelurahan* offices in Rejosari, Panggung Lor and Tanjung Mas were analysed in order to identify the *Kecamatan* to which most people had moved. Following this analysis five households were selected in the *Kecamatan* accounted for most migrants by *Kelurahan*. (from Panggung Lor to Semarang Barat, from Rejosari to Pedurungan; von Tanjung Mas to Genuk). These interviews are referred to as “migrant HH within SMG”.

<sup>15</sup> For a discussion of the difficulty to distinguish between environmental and other economic, social, politic etc. factors leading to migration see e.g. Felgentreff & Pott 2016; Tacoli 2011.

<sup>16</sup> One percent of respondents did not know where the out-migrants of the household had migrated to.

money and goods), whereas 56 percent do not contribute to the household income at all. On the other hand, it was only a third of all out-migrants that received assistance from the household members for their migration. Finally, the NRF survey confirms the perception that migration of one household member is not necessarily positive for the household: 46 percent disagree that a household with migrants living outside Semarang is better off, while only 28 percent agree with that perception. These figures indicate that, in contrast to other regions, in Semarang, neither migration of the whole household nor sending a household member into migration seem to be a common adaptation strategy [diversify household income and lessen the burden for the household].

The limited migration experience of the interviewed households is in line with the fact that Semarang has not been a priority area for the governmental resettlement program “transmigrasi,”<sup>17</sup> which mainly aimed at resettling people from the very populated Java Island to other Indonesian islands. In Central Java, most workers came from Cilacap (2014: 16,017), followed by Kendal Regency (2014: 11,216), west of Semarang. Semarang itself only counted 395 workers participating in the transmigrasi program in 2014 (figures provided by the Department of Labour, Transmigration & Citizenship in Semarang)<sup>18</sup>.

Households affected by environmental change in coastal Semarang do not just pack all their belongings and leave the area, but rather balance reasons for staying with those for moving. The interplay of environmental change and migration in Semarang is presented here in three categories: in situ adaptation, internal migration within Semarang City and finally in-migration into the coastal areas.

#### **4.1 In situ-adaptation**

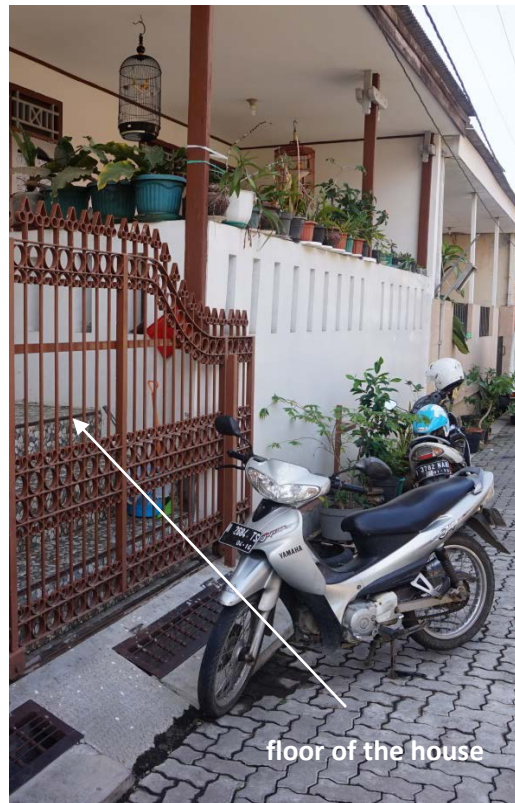
Based on the analysis of the qualitative interviews, three types of explanations for “in-situ adaptation” can be derived from the interview material: financial and economic considerations “strategic” reasons, as respondents termed them and socio-cultural reasons.

Among the economic and financial factors influencing migration decision-making in a context of flooding, and especially of land subsidence, one prominent factor is the costs of constant renovations, such as raising the floor, or even the whole house, to protect it from flooding. These financial burdens lead to several possible consequences: either the household head decides that his/her family will stay because they have already invested a lot in renovations and adaptation measures, or they decide to move because they cannot or do not want, to invest in the coastal house again, but prefer to spend their money on another house in a flood-safe area.

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<sup>17</sup> First introduced by the Dutch colonial administration (1905-1941), the so-called *transmigrasi* program aimed at reducing the number of inhabitants on the main island Java by populating outer islands with Javanese people. After independence in 1950 the Indonesian government initiated its own transmigration program, initiating also voluntary migration (Fearnside 1997). The program was criticised by NGOs stating it did not reduce population pressure in Java, but rather provoked social and political conflict on the outer islands.

<sup>18</sup> Unfortunately, the Department of Labor, Transmigration & Citizenship in Semarang did not provide figures for previous years to the author.



**Picture 1: House in Kel. Panggung Lor whose floor had been lifted for 3m in total. (Picture: Ziegelmayer 2015)**

Picture 1 shows a respondent's house, the floor of which he had raised three times, each time one meter. The house is located in Kelurahan Panggung Lor, a coastal sub-district of Semarang with a rather economically better-off population. The respondent explained that he financed the renovation measures in his house himself and that he chose a wooden structure for the roof that can be lifted up easily. Asked whether he ever thought of moving away, he answered that he likes the neighbourhood, its strategic location and that he would not get enough money for the present house to buy a comparable one elsewhere. The road in front of the house has been lifted four times (two meters in total) and was financed by a cooperative of the inhabitants of Panggung Lor. This cooperative, called "P5L," (*Paguyuban Pengendali & Penanggulangan air pasang Panggung Lor*) was founded in order to fight against tidal flooding and succeeded in building nine pump houses to pump water out of the area. Those pumps are still active today and the households in Panggung Lor pay a monthly contribution to P5L depending on their income and the size of their house (25-75.000 IDR /month)<sup>19</sup>.

P5L is a good example of how inhabitants with some financial means can succeed in organizing themselves to finance in situ adaptation measures to ongoing environmental changes in their area. In the two other analysed sub-districts, Tanjung Mas and Rejosari, there was no such formal initiative by inhabitants, indicating how the capacity to adapt depends on financial resources. Tanjung Mas and

<sup>19</sup> In July 2015 (time of the fieldwork) 1.70€- 5.17€.

Rejosari are home to poorer households than is Panggung Lor in general. In those areas, on the contrary, the local government financed the raising of some roads and public places, such as markets.

Van der Zwaluw confirms the importance of social relations and networks in encouraging coastal populations in Semarang to stay. Her research was conducted in Kemijen, a *Kelurahan* in North-East Semarang next to Tanjung Mas:

*The interviewed inhabitants with relatively more financial resources mostly preferred other adaptation strategies than migration. Heightening of the house seems to be a more preferable option than saving money in order to be able to move to another area. **The respondents considered moving as an expensive option.** The interviewed inhabitants who did not move but had enough money stayed either because it was cheaper to heighten the house or because they wanted to maintain their social position. (van der Zwaluw, 2013: VI; emphasis by the author)*

Those examples refer to homeowners. However, there are also respondents who lived in rented houses and still considered the financial aspect of environmental changes. They often argued against in situ adaptation and moved to avoid future rent increase once the landlord renovates the house again to protect it against flooding.

*Because if I keep staying in Kebon Harjo, the house might always need to be lifted up. Maybe in three or four years, the flood could reach the house so the owner needs to lift up the house again. It surely will make the rent cost increase as well. (Interview 55, migrant HH within SMG, 31.07.2015)*

According to the NRF survey, almost half of the interviewed households had lifted their house's floor at least once, on average about five years before and mostly one or two meters higher. This indicates that raising the floor of one's house is a crucial adaptation strategy among coastal populations.

To summarize, those who own a house prefer to invest in adapting it to flooding rather than moving away. Those who rent prefer to move if they have the means to prevent higher rents that might result from adaptive measures taken by the landlord.

As stated in the beginning, not everyone moves out of coastal Semarang because of environmental problems. Among those who stay, their reasons differ.

There are those who simply do not have (financial) means to move or to renovate their coastal house; they could be referred to as "trapped populations" (Black and Collyer, 2014). Laczko and Piguet refer to "those left behind": these are the populations who might be "the worst affected by climate change," affected more intensely than the migrants themselves. (2014: 16f)

One example is a respondent in Panggung Lor who never considered moving away because "I didn't have enough money." (Interview 35, out-migrant's HH Panggung Lor, 11.07.2015) He considered the place where he is living cheaper than the costs of a possible movement. His children, however, moved out, one by one, to study or work elsewhere. In the same way that it is difficult to estimate how many people left the coastal areas due to environmental change, it is difficult to estimate how many people should be considered as "trapped" in Semarang. The NRF survey for example shows a monthly average income for 41 percent of the interviewed households of 1-2,5 million IDR and only 500,000 to 1 million



IDR<sup>20</sup> for another 26 percent of the HH. Official figures for 2016 indicate that 4.85 percent of Semarang's population were living in poverty in 2016.<sup>21</sup>

Another respondent states, when asked about the difference between those who decide to move and those who decide to stay:

*R1: There is a difference. Probably they don't move, not because they don't want to, but because they can't afford a new place. Although they sell the old house, the money they get is not necessarily enough. We were also doubting whether or not moving out was the best choice. But then we realized that if we don't use the saving soon, it would be just used up on a rented house. [...]*

*UZ: And according to you, why some people don't want to move away?*

*R1: One is because they lack money, and the other one is because that's the place where they earn their living. Maybe they work there, or have a shop there and they have already gained their regular customers, so it's hard to just leave and start over the business in the new place. (Interview 52, migrant HH within SMG, 30.07.2015)*

This last quote indicates another reason why people might decide to stay in the coastal area despite environmental problems: their livelihoods depend on the coastal areas. Many respondents used the term "strategic location" to refer to coastal Kelurahan, in order to explain why they stayed there. Living near the coast means living close to the sea for the fishermen, close to the harbour for those working there, close to the factories, for example those of the textile industry, for workers, close to the market for those working as traders or porters and, finally, close to the train station, as well as the airport, for those whose professional activities require mobility. One respondent in Panggung Lor enumerates all the important types of infrastructure which qualify Panggung Lor as a "strategic location":

*R1: [...] usually the people who have stayed here for ages would stay still, because, regardless the flooding, this area is very strategic for staying in. The airport, the station, hospital, market are all close and reachable easily from here. (Interview 34, out-migrant's HH Panggung Lor, 11.07.2015)*

Those who mention "strategic location" in their explanations of why they stay, despite flooding and land subsidence, are mostly living in the economically better off Kelurahan Panggung Lor. They often have the financial means to adapt, by for example, lifting their house so as not to be bothered by indoor flooding.

Besides strategic and financial considerations, there is of course also a social aspect to the decision of whether or not to leave one's house in the coastal area. Some respondents state that they still stay in their house despite flooding (etc.) because it is a family house, representing an inheritance from loved ones which they do not want to abandon. Another social, or even spiritual, explanation is especially relevant to the ethnic Chinese of Semarang, many of whom live in Kelurahan Panggung Lor. This population group often believes that living near the water brings fortune and good luck in business, a perception influenced by Feng Shui principles. This is one reason why many Chinese stay in the coastal area despite flooding. Those who have the financial means keep their house near the coast, but live in another house in a flood-safe area:

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<sup>20</sup> 68-157€ and 34-68€ (July 2016).

<sup>21</sup> BPS Kota Semarang (2017: 155).

R1: *It's because the Chinese normally like to live in a group. And it was said that they indeed prefer to live near water source like the sea because they believe it will bring them fortune.*

UZ: *But as for you, you think that it's better to move than to have to always face the flooding?*

R1: *Of course. But the Chinese who are rich normally have another house in other places aside from one in Tanah Mas.*

UZ: *But they still stay at the house in Tanah Mas?*

R1: *Yes. They don't sell the house. [...] There are also Chinese among them who moved.*

UZ: *But they don't sell the house, do they? So they could come back anytime.*

R1: *Yes, if they are wealthy enough. If that's the case, they indeed would normally leave the house to be used by relatives or to be rented. Otherwise, if they've only got a few excess of money, they would rather leave the house for sale and then buy a new one elsewhere. [...] (Interview 51, HH MM SMG (SMG Barat), 30.07.2015)*

In addition to this reasoning, special to Semarang's ethnic Chinese, there is a strong attachment to place, family and livelihood among the Javanese coastal population. Handayani and Kumalasari cite the Javanese value of "*mangan ora mangan ngumpul*," meaning "in bad or the worst conditions, sticking together with all family members is the most important thing." (Handayani and Kumalasari, 2015)

It is not only the attachment to place that motivates coastal people to stay, but the perception of flooding by the coastal populations in Semarang also plays a role. Van der Zwaluw (2013) suggests in her work on Kemijen in North-East Semarang that the inhabitants do not necessarily see water in the area as flooding and as an insurmountable threat. This is, on the one hand, due to the fact that regular (tidal) flooding has become a part of their daily life and, on the other hand, it is due to factors relating to income. Inhabitants who have the financial means to lift their house and thereby protect themselves and their belongings might not see flooding as an urgent risk. It is therefore not only the objective height and frequency of the flooding, but also the (financial) means of the populations to protect themselves against it, that determines their perception of flooding and there, in the long-run, their decision to move or to stay.

Goldbach confirms that respondents perceive the tidal floods that occur on a regular basis (not like sudden-onset flooding) "as less severe, since streets and houses are regularly inundated for a shorter period of time without threatening health or lives." (2017: 26) She continues, stating:

*"Erosion and subsidence have also been experienced for several decades already with the result that their impacts are not new for respondents in those regions. Furthermore, the great majority of people in Semarang adapts to constant subsidence and the concomitant inundation threats by lifting houses, floors and valuables, building drainages, and similar." (ibid.: 26f)*

A Javanese saying even equates the city of Semarang with flooding, illustrating how coastal populations are used to live with the flooding. (Fieldnotes, 29.06.2015)

Finally, another element that explains why environmental change in Semarang is not followed by (massive) out migration might be the above-mentioned historical context: the migration history and experience of affected populations. As a coastal port city, Semarang has attracted in-migrants since colonial times, but, as the example of the transmigration program shows, the city has never been a major location of out-migration. This limited familiarity of Semarang's population with out-migration, as well as the fact that those who migrate to Semarang in search for work accept difficult environmental living conditions, is certainly part of the explanation of why Semarang's population is rather immobile,

of why, when people do migrate, they do so over relatively short distances and in relatively small numbers.

#### 4.2 Internal migration in Semarang



Picture 2: House sunken below the road and abandoned by its inhabitants, Kel. Panggung Lor (Picture: Ziegelmayer 2015)

The interviews indicate – especially for households affected by river and tidal flood and land subsidence – that those who decide to leave the coastal areas of Semarang do not migrate out of the city completely but, rather move to parts of town that are not affected by those environmental changes, especially to upland areas in the southern part of the city:

*UZ: Would you say there are many people who moved away because of the flooding?*

*R1: Yes. Around here there were three families who moved, whereas in Gang Enam [street 6], almost half of the inhabitants moved out.*

*UZ: And where did they move? Do you know?*

*R1: To another part of Semarang City.*

*T: They chose the place where they could avoid the floods?*

*R1: Yes. My sisters and brothers also suggested me just moving out and selling this house. However, this house wouldn't make much money so it would be difficult to buy another house in the new place. (Interview 34, out-migrant's HH Panggung Lor, 11.07.2015)*

The perception that many inhabitants moved because of the flooding is shared by other inhabitants of Panggung Lor. Furthermore, the statement strengthens the argument that the majority of environmental change-related migration in Semarang is directed towards geographically proximate areas, that is to other sub-districts of Semarang, preferably those that are further from the coast and therefore not prone to flooding. This is congruent with the above-mentioned research on short-distance migration in contexts of environmental change. These findings also underline the extent to which migrant trajectories in Semarang are embedded in urbanisation processes. As the flooding in Semarang's coastal areas is not only a problem during the rainy season but is a problem throughout the year due to tidal floods, temporary migration, such as seasonal migration, was not mentioned as an adaptation strategy by respondents. Those who move, although they often not move far, move permanently.

Finally, the quote shows how residents of the coastal areas threatened by flooding balance reasons that weigh for and against moving, juggling the potential benefit of moving (being safe from flooding) with the financial loss that would result from being unable to sell their homes at a good price. The latter might cause difficulties to buy a comparable house in another part of Semarang and is even more difficult when house prices are falling in the coastal areas due to flooding and land subsidence. As Semarang as a whole experiences more in- than out-migration, the city is booming, rents and house prices are rising. This situation makes moving from coastal areas to other sub-districts even more difficult for poorer households from the coastal areas because of high house prices in the potential destination areas. This is due to the above-mentioned urbanisation processes, including the development of new settlements in the fringe area that are not affordable for poor populations.

During the fieldwork, many respondents stated in one way or the other that “there were many who moved away from the coastal areas to other parts of Semarang because of the flooding.” It was, however, very difficult, not to say almost impossible, to trace those internal migrants in Semarang. Due to lack of data and information, it is hard to know approximately how many people moved primarily because of environmental changes. For the same reasons, it is difficult to know with any specificity when they moved. As stated above, migration rates on a Kecamatan (sub-district) level, however, show that half of the sub-districts, those located at the coast and in the city centre, have negative net-migration rates (see figure 3). Population growth on a Kecamatan level between 2009 and 2013 shows that while the whole of Semarang experiences a slowly decreasing population growth of around 1-2 percent (1.7 percent in 2009; 1.4 percent in 2010; 1.1 in 2011; 0.96 percent in 2012 and 0.83 percent in 2013), there are three Kecamatan that consistently experienced negative population growth during that period (Semarang Selatan; Semarang Timur and Semarang Tengah). Those three Kecamatan are part of the above mentioned Kecamatan in the core and coastal area of Semarang that experience a negative net-migration rate. (own calculations based on BPS Semarang in Figures 2009; 2010; 2011; 2012; 2013; 2014)

All respondents agreed that most movements out of the coastal area were directed to other parts of Semarang, not further away. These movements however mostly concern households with a higher income that can afford new houses in the new suburbs.

Migration data provided by the three Kelurahan offices where the household interviews were conducted indicate that most people from a particular Kelurahan simply moved to a neighbouring Kecamatan: People from Panggung Lor moved to Semarang Barat, also located on the coast; those from Tanjung Mas and Rejosari, both economically worse off than Panggung Lor and Semarang Barat, moved to Kecamatan in the fringe area<sup>22</sup>. Box 1 presents an example of migration within Semarang and serves as a showcase for a complex decision making among household members, balance environmental change with the possibilities of internal migration. Their movement was not linear nor was the decision-making mono-causal.

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<sup>22</sup> Inhabitants of Rejosari in the city centre near the river had moved to Pedurungan in the east part of town and inhabitants from Tanjung Mas near the harbour had moved to Genuk still at the coast but on the east fringe area

The majority of the interviewed households who had moved within Semarang shared experiences with environmental problems, mainly flooding at their former place of residence. They, however, rarely considered these environmental problems to be the main reason for their move. The move was, rather, explained by either financial problems which forced them to sell the former house; family related issues (taking care of a sick parent or wanting to have one's own house as a young couple); or by eviction, due to conflicts over land tenure. All of those households shared an experience of several prior relocations within Semarang. According to the respondents, however, it was not the environmental problems in the coastal area that initiated their first move (or relocation).

**Box 1: Migrant trajectories within Semarang<sup>23</sup>**

Ibu Helmia moved with her husband and children from Kelurahan Rejosari to Kecamatan Pedurungan in the eastern part of town far from the coast, the latter not affected by flooding. She used to live in Rejosari in the house of her parents-in-law, with them as well as with two of her husband's siblings and their families. However, she recounted that, "Since the house always got flooded, my husband decided to rent a house for me and my children in Mangkang. My husband kept staying in Rejosari. But on Friday afternoon, he would come to Mangkang." With Mangkang in North-Western Semarang being quite far from the husband's workplace, he continues to live in his parent's house – accepting the constant flooding – while his wife and children moved to Mangkang. Later, the mother-in-law decided to sell the family house in Rejosari and to divide the amount she got among all of her children who did not yet have their own house. The decision to sell the family house was also influenced by the constant flooding according to the respondent. The timing of the move was chosen in order to avoid expending additional money by again lifting the house

*The flooding was one of the reasons [why the mother-in-law sold her house]. Furthermore, the mother was already very old and she was alone in the house. The family then held a meeting and it was decided that they better sold the house soon. If not, the house would possibly need to be lifted up again next time which surely would cost quite a lot of money, while the mother's income was solely from her late husband's pension.*

It is with this money from the sale of the house that Ibu Helmia and her husband are able to pay for the current house in Pedurungan (periphery in Eastern Semarang), in instalments. After some time in Mangkang, they decided to move to this Kelurahan as it is close to the husband's workplace and it is free from river and tidal flooding. Family contacts have played a role in choosing this destination as they learned about it from one of the respondent's siblings who had been living there for five years and who had also left a flooded house near the coast to move to Pedurungan. This sibling, however – whether on purpose or because they could not find a buyer – has not yet sold his house in the coastal area, but instead uses it for "investment purposes", probably renting it to gain some additional income.

Another respondent observes that, for example, those house owners who decide to leave the Kelurahan Rejosari in central Semarang – a Kelurahan not located on the coast and that is mostly suffering from river flooding – are not able to sell their houses but nevertheless move away, leaving the houses abandoned:

<sup>23</sup> Interview 52, migrant HH within SMG, 30.07.2015.

*[...] many people moved away from this area. However, if the movement was caused by flooding, they would mostly just abandon the house. That's why many houses are left empty, particularly in Purwosari [North Semarang]. (Interview 46, out-migrant's HH Rejosari, 13.07.2015)*

This history of internal movement in Semarang highlights the above mentioned balancing of the possible costs of staying versus those of moving. It is shown to be a negotiation process within the family influenced by external factors, such as flooding and land subsidence connected to the price of the house, costs of renovation and the distance to the work place, etc. This example elucidates how migration even for short-distances within Semarang, is influenced by financial considerations as well as by negotiations within the family. The trajectory, finally, connects different sub-districts of Semarang and is part of the city's suburbanisation processes, at the same time confirming the non-linearity of migration in a context of environmental change.

Goldbach concludes that people with good social networks (outside the coastal area) are more likely to move. (2017: 27) This refers to the above mentioned example of coastal residents who decided to move to another place in Semarang where relatives were living.

### **4.3 In-migration to Semarang despite environmental problems**

As stated above, Semarang is characterized by more in- than out-migration. This is not a recent phenomenon but has a long historical tradition. As the Semarang based Anthropologist Mujahirin states:

*Semarang is a city with a port, so since the port existed very long time ago, in the colonial era, the migration also existed. Only the level and the number, as well as the motivation have changed. In the colonial era, most people migrated to Semarang to get a job in customs or in the port. Later Semarang turns into the governmental centre as well as trade centre in Central Java, so the attraction is increased, which means that the need to go to live in Semarang is also rising. (Interview 49, Anthropologist, 29.07.2017)*

The general secretary of the Semarang Development Planning Agency (BAPPEDA) compares Semarang with sugar referring to an Indonesian proverb, "Ada gula, ada semut" (Where there is sugar, there are ants). Despite its environmental problems, especially in the coastal areas, Semarang continues to attract migrants from surrounding areas. He only mentions out-migration from Semarang in reference to well-educated people who get job opportunities in Jakarta or even abroad. However, they are fewer in number than those who move to Semarang. He furthermore points at the close link of this in-migration to the growth of the informal sector. From 2000 to 2010, this sector experienced a growth of 50 percent. Referring to those in-migrants in the informal sector, the BAPPEDA general secretary states that according to an Indonesian or East Asian culture of hospitality people would feel guilty in rejecting in-migrants arriving in search of a better life in the city. Therefore, despite the legal regulation of the numbers of street vendors per Kelurahan, the local administration often gives more permits to stay and sell. (Interview 29, BAPPEDA secretary, 10.07.2015) This fact might, however, also be interpreted as an indicator of an ineffective, if not corrupt, governmental administration.

Mujahirin describes the mechanisms of "chain migration" (cf. Price 1963) especially for those in-migrants with a low level of education who are working in the informal sector. He explains why they accept difficult living conditions in coastal areas:

*At first they usually move to their friends' (or relatives') house, who have been living in Semarang earlier. Although sometimes the place is actually not really proper, they would live there for one to three months until they could manage to get a place for living by themselves, like renting a house or a room around Semarang Utara [North Semarang]. They usually live in not feasible neighbourhoods, such as in Bandarharjo. They face flooding and other environmental challenges everyday but they also have to feel comfortable there because they think that the condition is better than in their hometown. (Interview 49, Anthropologist, 29.07.2017)*

Mujarihin further points to the community oriented understanding of life among Javanese people. Pleasures and happiness, in this context the advantages of living in the city, should be shared among family members, but the sufferings and the difficulties related to it should not be shared:

*[...] if a person thinks that he is able to involve or to invite his relative from the village, he will do, but if he thinks he is still living miserably, he will hide it and will not invite his relative. He will try to survive and if he succeeds he will invite his relative to come. (Interview 49, Anthropologist, 29.07.2017)*

Suyanto, another anthropologist at Diponogoro University in Semarang, whose research focuses on traders at Semarang's markets, stresses the benefits for migrants and for Semarang, the receiving city, alike: "[...] among the traders in many of the traditional markets of Semarang, in-migrants outnumber the locals. They come for example from Solo, and even there are also people from Padang."

He explains this in-migration by classic economic motives such as the possibility of earning more money in Semarang than in the migrants' areas of origin, and thus the opportunity to help the family members left behind. On the other hand, all these in-migrants also contribute to Semarang's economy, according to Suyanto. (Interview 60, Anthropologist, 05.08.2015)

These in-migrants partly fill the spaces left by those who moved from the core and coastal area to the fringe area of Semarang. In-migration to Semarang is an essential aspect of urbanisation in Semarang, where the migrant workers represent informal workers as well as the workforce needed for the factories, the harbour and also the growing service sector.

An important group of the informal sector in Semarang include (street food) vendors, porters at the markets and construction workers. There are also professionals moving to Semarang because their employer transfers them, but they are the minority and they do not move to the coastal area but rather to the above mentioned new peripheral settlements. A third group of in-migrants are students moving to Semarang to study at one of the various universities.

In contrast to the out-migrants from Semarang who seem to only leave if they have a specific destination and work to do in mind, or if they get married and move to join their spouse, there are several in-migrants among the respondents who just came to Semarang looking for a job. Those in-migrants, however, especially those who later end up working in the informal sector, often come to Semarang without having a specific job opportunity. Rather, they rely on family contacts and just hope to find work "in the big city". Many then become as street food vendors, porters, *becak*<sup>24</sup> drivers etc.

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<sup>24</sup> *Becak* are bicycle taxis.

Others come with the specific hope of finding work in the textile industry, where demand is high and newcomers often find a job within a few days or weeks.

Coming to Semarang in search of work (and a better life), they are ready to accept the difficult living conditions of coastal areas because they want to be close to their workplace and housing is affordable.. In-migrants thereby “fill in” the space left by house owners who decided to leave the coastal areas (because of flooding). Renting their houses as dormitories for workers brings additional income to the (migrated) households. Many in-migrants work either in the informal sector at the main market *Pasar Johar* or as workers in one of the factories near the harbour. Proximity to their work place therefore seems to be more important than environmental threats such as flooding and land subsidence.

In her work on the neighbouring rural area Morodemak, Gerstenberg confirms the importance of social structure in the communities affected by environmental changes. “Self-help among the population, neighbourhood networks, strong community ties and functioning local institutions are crucial for adaptation processes” (2016: 66), the author concludes, and she stresses the “back-up” function of community ties, in the context of a lack of social security systems provided by the government. To answer the question whether or not migration can be seen as important adaptation strategy, the case presented by Gerstenberg shows how Semarang City is linked to and embedded in the surrounding regions. Whereas, as mentioned above, in Semarang out-migration is not (yet) a common adaptation strategy among households, and the city is even attracting in-migrants, in Morodemak, “Long-term out-migration is one important livelihood strategy [...] especially among younger generations.” (ibid.) Gerstenberg clearly identifies the “diversification of income sources” (ibid.), in a context of declining revenues in the fishing sector due to environmental changes, as the main goal of these out-migrations.

The NRF survey indicates a rather sedentary population with 54 percent having always lived at their current place of residence and, out of those who had moved there, 41.2 percent have lived there for more than 30 years, another 35 percent for 10 to 29 years and only 24 percent for less than 10 years. Among the interviewed households, only 28 percent had received in-migrants within the last 20 years and only 30 percent of them had received assistance for their migration (mostly from a household member (61 percent)). The majority of those in-migrants moved due to family reasons (54 percent), followed by work (30 percent) and education (10 percent).

The situation in neighbouring rural Morodemak is quite different: 70 percent of the out-migrants received assistance (mostly from family members (88 percent) and in form of advice and information (26 percent) or financial support (13 percent), transport or housing). (Gerstenberg, 2016) These figures confirm the above mentioned complementary picture: whereas in Semarang the out-migration of a family member is not (yet) seen as a major adaptation strategy, in rural Morodemak it is.

A couple from neighbouring Demak explained why it had come and stayed in Semarang with the opportunities the city is offering them. Back in Demak their only work was farming and in Semarang they succeeded in establishing their small family business by collecting and selling all sorts of metal and other waste that could be recycled. In this way they earned more than they would have as farmers in Demak. (Interview 18, 19, in-migrants, 05.07.2015)



Gerstenberg (2016) confirms that people gain opportunities when they move to the city when she cites one of her respondents who states that working in the city offers more opportunities to earn one's living than fishing or farming in the rural areas. These latter activities are highly dependent on weather conditions and affected by extreme weather events and sea-level rise and erosion.

For this paper we chose the case of young women working in the garment industry in coastal Semarang to illustrate why Semarang is attractive for in-migrants.

Semarang hosts over ten garment factories and is known in the surrounding rural areas as a potential work place especially for young women. For example, it seems to be common for young women in Demak, east of Semarang, to migrate to Semarang after completing high school in order to work in one of the various textile industries. The young women often already know a sister or a friend who works in Semarang and the time span between leaving the parents' place in Demak, moving to Semarang, applying for a job is usually very short. There are cases where young respondents found a job within only one week or even one day.

These contacts of friends or relatives who already live and work in Semarang's garment industry provide important help for newcomers. They are often the ones who inform the potential migrants about vacancies in the factories and provide a place to sleep in the beginning often sharing their room in the dormitories with the new arrivals or tell about dormitories where newcomers find a place to stay.



**Picture 3: This boat brings the young women every morning from Tambaklorok to their workplace at the other side of the water. (Picture: Ziegelmayr 2015)**

Some of the young textile workers state that they found their current job through sewing courses they came to take in Tambaklorok, a part of Kelurahan Tanjung Mas. Some sewing teachers have agreements with the factories: they are provided with sewing machines for the courses and the young women get hired right after finishing the sewing course.

For most textile workers interviewed, one important motivation for leaving their parents' house and moving to a dormitory in the regularly flooded areas of Semarang, was the desire to help their parents and family back home and their sense that it was their responsibility to do so. Many respondents clearly state that they came to work in the textile industry not only for their own well-being or out of their own wish to leave rural Demak for the big city Semarang. Although some were afraid of moving to Semarang, it was obvious to them that their aim was to work and help their parents.

*Since we came from average economic level family, I and my older siblings wanted to get the job to help our parents. By working, we wish to get many experiences as well. (Interview 62, in-migrants Tanjung Mas, 09.08.2015)*

*I only have one dream. I want to see my parents live a happy life so I want to help them. (Interview 63, in-migrant Tanjung Mas, 09.08.2015)*

Coming from a rural area, the city of Semarang represents (economic) opportunities for these young women and they decide to move despite their fear, motivated by a social responsibility for their families. In this context, the responsibility for parents as well as the economic opportunities carry more weight than the risks of flooding and land subsidence in the part of Semarang where they relocate. Additionally, those migrants coming to Semarang from neighbouring coastal regencies had already experienced flooding and did not mention environmental problems in Tanjung Mas as reasons why they considered moving.

Regarding the timing of these young women's migrations, there are cases where women come to Semarang right after school, work there for some years and then go back to Demak for example to get married. Others interviewed have already been in Semarang for about five years and are married. Either the husband also works in Semarang or he works back in Demak. The geographical proximity of Semarang and Demak allows facilitates contact with parents and spouses and makes it easy to see them regularly. Asked about their future plans, none of the young women considered working in the garment industry for the rest of their lives. They either had plans to earn enough money to finance their university studies or to become self-employed, with their own sewing machine.

The garment workers earn about the minimum wage of 1,685,000 IDR/month<sup>25</sup> and some of them send most of this money home to their parents, between 500,000 and 1 million IDR. They normally work for 12 hours a day in the factories and can earn up to 2.5 million IDR<sup>26</sup> if they work additional hours.

As the young women often share a room in the dormitories (sometimes rented by house owners who left the coastal areas because of environmental problems to other parts of Semarang), they can save a lot of money. One room in a dormitory costs about 100,000 IDR<sup>27</sup>. Some respondents go home to visit their family every two weeks or at least once a month. Often they then take their remittances directly to their relatives, without losing money on transfer services.

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<sup>25</sup> about 115€ (July 2016)

<sup>26</sup> about 172 € (July 2016).

<sup>27</sup> about 6.90€ (July 2016).

Analysing migration in Semarang from a gender perspective, the textile workers are an example of mostly female migration. In addition to the economic opportunities which textile industry employment provides them, living on their own in Semarang also offers some freedom to those young women, for example meeting their boyfriend at the dormitory, something which would hardly be possible at their parents' place.

Men who move to Semarang work as fishermen or market porters. According to one respondent, however, men prefer to migrate to other islands, such as Kalimantan or Sumatra, or even to Malaysia, in order to work in the palm oil industry.

The example of migrant female textile workers, who move to Semarang despite environmental changes in the coastal areas where they live and work, illustrates clearly that environmental change does not forcibly lead to out-migration but that a complex interplay of various factors influences the actors' decisions to stay or to move.

## **5 Conclusion**

As our analysis shows a migration decision in a context of environmental change is never mono-causal. Environmental change, here consisting mainly of flooding and land subsidence, is simply one factor that influences decisions of (im)mobility in a specific context.

Despite its environmental problems, Semarang represents a destination for in-migrants, the majority of whom leave neighbouring regencies or other places in Central Java in search of work. The less educated are absorbed by the booming city that hosts a growing informal sector, as well as industries and an expanding service sector in need of workers. Even if those new-comers face (environmental) difficulties, leaving Semarang for another place is not a reliable option. Rather, they consider, as autochthones do, moving within Semarang to flood-free areas, depending on their (financial) capacities.

"In situ adaptation" is shown to be a major reaction to environmental changes. As long as people have the necessary financial means, or as long as the administration provides services such as elevating the roads, many people prefer to stay in the coastal areas that are close to their place of work and where they are embedded in their social networks. Financial resources and social networks play a major role in shaping people's adaption capacities. The poorer the household or community is, the more they depend on governmental support, for example lifting up roads to adapt to environmental changes. There are, however, also those who might be qualified as "trapped" in the coastal areas because they simply do not have the (financial) means or contacts to move elsewhere. They therefore stay and are immobile due to a lack of alternatives.

Those who can afford to move and buy a house elsewhere leave the coastal areas but still stay in Semarang. This fact confirms the analysis that migration in a context of environmental changes is mostly over short-distances.

As this paper shows, environmental changes in coastal Semarang do not prevent people from moving there. On the contrary, the city remains attractive for in-migrants due to its various job opportunities, especially in the informal sector. These opportunities counterbalance the environmental problems,

especially flooding, that in-migrants face in the coastal areas. As the BAPPEDA general secretary put it, “Semarang is like sugar.” In other words, the city attracts migrants despite its environmental challenges.

This paper argues that decisions of moving or staying – mobility versus immobility – are always, also in the context of environmental changes, negotiated on individual, household and community levels. These negotiations are influenced by the specific context – in the case of Semarang, urbanisation processes.

## 6 Bibliography

- Adamo SB (2013) Addressing Environmentally Induced Populations Displacements: A Delicate Task. In: Hugo G (ed.) Migration and climate change. Cheltenham, UK, Northampton, MA: Edward Elgar, pp. 108–126.
- Anita J and Latief H (2013) Coastal Flooding Adaptation by Housing Adjustment in Coastal Settlements Case Studies Muara Angke, North Jakarta and Tambak Lorok, Semarang. Bandung, Indonesia.
- Badan Pusat Statistik (2012) Statistics of Migration Jawa Tengah: Results of the 2010 Population Census. Jakarta.
- Badan Pusat Statistik Kota Semarang (2010) Semarang Municipality in Figures 2009. Semarang.
- Badan Pusat Statistik Kota Semarang (2014) Semarang City in Figures 2013. Semarang.
- Bappeda Kota Semarang and Badan Pusat Statistik Kota Semarang (2009) Semarang Municipality in Figures 2008. Semarang.
- Bappeda Kota Semarang and Badan Pusat Statistik Kota Semarang (2011) Semarang Municipality in Figures 2010. Semarang.
- Bappeda Kota Semarang and Badan Pusat Statistik Kota Semarang (2012) Semarang Municipality in Figures 2011. Semarang.
- Bappeda Kota Semarang and Badan Pusat Statistik Kota Semarang (2013) Semarang Municipality in Figures 2012. Semarang.
- Bappeda Kota Semarang and Badan Pusat Statistik Kota Semarang (2017) Semarang Municipality in Figures 2016. Semarang.
- Black R and Collyer Michael (2014) Populations ‘trapped’ at times of crisis. *Forced Migration Review* 45: 52–56 (accessed 2 December 2017).
- Fearnside PM (1997) Transmigration in Indonesia: Lessons from its environmental and social impacts. *Environmental Management* 21(4): 553–570.
- Felgentreff C and Pott A (2016) Climatic turn in migration studies? Geographical perspectives on the relationship between climate and migration. *DIE ERDE – Journal of the Geographical Society of Berlin* 147(2): 73–80.
- Gerstenberg A (2016) Vulnerability of households and adaptive responses to changing environmental conditions: A case study in the rural coastal area of Central Java, Indonesia. Master Theses, Free University. Berlin.
- Gilbert A and Gugler J (1991) *Cities, Poverty and Development: Urbanization in the Third World*. New York: Oxford University Press.
- Goldbach C (2017) Out-migration from Coastal Areas in Ghana and Indonesia—the Role of Environmental Factors. *CESifo Economic Studies* 63(4): 529–559.
- Handayani W and Kumalasari NR (2015) Migration as Future Adaptive Capacity: tThe Case of Java – Indonesia. In: Hillmann F, Pahl M, Rafflenbeul B and Sterly H (eds) *Environmental change, adaptation and migration: Bringing in the region*. Basingstoke, Hampshire: MacMillan/Palgrave.
- Handayani W and Rudiarto I (2014) Dynamics of Urban Growth in Semarang Metropolitan – Central Java: An Examination Based on Built-Up Area and Population Change. *Journal of Geography and Geology* 6(4): 80–87 (accessed 10 November 2014).
- Helmi, M., Irwani, R. P., Denny, N., & Sunaryo (2014). Illustration of Hazard and Issues on Semarang Coastal Area. Lab. Of Ocean Modeling and Marine Information System Marine Sciences Department, Faculty of Fisheries and Marine Science Diponegoro University, Semarang.

Urbanization and Marine Sciences; How to Develop Resilience Processes to Cope with Natural Hazard.

- Hillmann F (2016) Migration: Eine Einführung aus sozialgeographischer Perspektive. Stuttgart: Franz Steiner Verlag.
- Hillmann F, Pahl M, Rafflenbeul B and Sterly H (2015) Environmental change, adaptation and migration: Bringing in the region. Basingstoke, Hampshire: MacMillan/Palgrave.
- Hillmann F and Spaan E (2017) On the Regional Rootedness of Population Mobility and Environmental Change. *Comparative Population Studies* 42: 25–54.
- Hillmann F and Ziegelmayr U (2016) Environmental change and migration in coastal regions: examples from Ghana and Indonesia. *DIE ERDE* 147(2): 119–138.
- Hugo G (1996) Environmental Concerns and International Migration. *International Migration Review* 30(1): 105–131 (accessed 16 June 2014).
- Hugo G (2013) Migration and climate change. Cheltenham, UK, Northampton, MA: Edward Elgar.
- Hunter LM (2013) Migration and Environmental Hazards. In: Hugo G (ed.) Migration and climate change. Cheltenham, UK, Northampton, MA: Edward Elgar, pp. 273–302.
- Jong HN (2018) What will Jokowi's legacy be in climate change? The Jakarta Post, 26 March. Available at <https://www.thejakartapost.com/life/2018/03/26/what-will-jokowis-legacy-be-in-climate-change.html> (accessed 10 October 2018).
- Laczko F and Piguet E (2014) Regional Perspectives on Migration, the Environment and Climate Change. In: Piguet E and Laczko F (eds) People on the move in a changing climate: The regional impact of environmental change on migration: Springer, pp. 1–20.
- Marfai MA and King L (2007) Monitoring land subsidence in Semarang, Indonesia. *Environmental Geology* 53(3): 651–659.
- Marfai MA and King L (2008) Coastal flood management in Semarang, Indonesia. *Environmental Geology* 55(7): 1507–1518.
- Marfai MA, King L, Sartohadi J, Sudrajat S, Budiani SR and Yulianto F (2008) The impact of tidal flooding on a coastal community in Semarang, Indonesia. *Environmentalist* 28(3): 237–248 (accessed 15 July 2014).
- Massey D, Axinn W and Ghimire D (2007) Environmental change and out-migration: Evidence from Nepal.
- McLeman, Robert A and Hunter, M Lori (2010) Migration in the context of vulnerability and adaptation to climate change: Insights from analogues. *Wiley interdisciplinary reviews. Climate change*. 1. 450–461. 10.1002/wcc.51.
- Mercy Corps (2010) Vulnerability and Adaptation to Climate Change A Community-based Vulnerability Assessment. Available at: [http://resilient-cities.iclei.org/fileadmin/sites/resilient-cities/files/Images\\_and\\_logos/Resilience\\_Resource\\_Point/MercyCorps\\_Oct\\_2009\\_A\\_Community\\_Based\\_Vulnerability\\_Assessment.pdf](http://resilient-cities.iclei.org/fileadmin/sites/resilient-cities/files/Images_and_logos/Resilience_Resource_Point/MercyCorps_Oct_2009_A_Community_Based_Vulnerability_Assessment.pdf) (accessed 7 August 2015).
- Mulyana W, Dodman D, Zhang S and Schensul D (2013b) Climate vulnerability and adaptation in the Semarang Metropolitan Area: a spatial and demographic analysis: Technical Briefing.
- Mulyana W, Setiono I, Kracker Selzer, Amy, Zhang S, Dodman D, et al. (2013a) Urbanisation, Demographics and Adaptation to Climate Change in Semarang, Indonesia. London.
- Obokata, R., L. Veronis, and R. McLeman (2014) “Empirical Research on International Migration: A Systematic Review”, *Population and Environment* 36, 111–35.

- Piguet E (2010) Climate Change and Migration: A Synthesis. In: Afifi T and Jäger J (eds) Environment, forced migration and social vulnerability. Berlin, London: Springer, pp. 73–85.
- Piguet E and Laczko F (2014) People on the move in a changing climate: The regional impact of environmental change on migration: Springer.
- Price CA (1963) Southern Europeans in Australia. Melbourne: Oxford University Press.
- Richards J-A and Bradshaw S (2017) Uprooted by Climate Change: Responding to the growing risk of displacement: Oxfam.
- Setioko B (2010) The Methamorphosis of a Coastal City: Case Study Semarang Metropolitan. *Journal of Coastal Development* 13(3): 148–159.
- Tacoli C (2011) Not only climate change: mobility, vulnerability and socio-economic transformations in environmentally fragile areas of Bolivia, Senegal and Tanzania. *Human Settlements Working Paper Series - Rural-Urban Interactions and Livelihood Strategies* (28).
- UNHCR (2017) Global Trends in Forced Displacement in 2016.
- van der Zwaluw H (2013) Migration and social relations in a local community in the context of flooding: A case study in Semarang, Indonesia, Radboud Universiteit Nijmegen.
- Ziegelmayr U and Spaan E (2018) Migrant trajectories within the context of demographic, socio-economic and environmental change: Evidence from coastal Ghana. In: Hillmann F, van Naerssen T and Spaan E (eds) *Trajectories and Imaginaries in Migration: The Migrant Actor in Transnational Space*. Oxford: Routledge.
- Ziegelmayr U, Herbeck J and Hillmann F (forthcoming) Environmental Studies and Migration. In: *Sage Handbook of International Migration*.